

REMARKS

The present application has claims 23-25, 27-29, 31, 32, 34-37, 41-43, 45, 46 and 47 pending. Applicants have herein amended claims 23 and 32.

Independent claim 23 has been amended to specify that the sealing material is reinforced by an electrically insulating inorganic material which is incorporated into the sealing material as a filler during compounding. Support for this amendment may be found on page 13, lines 21-34, of the English translation of the application. The amendment to claim 32 simply deletes parts of the original claim. None of the amendments introduces new matter to the present disclosure.

In the February 15, 2011 Office Action, the Examiner rejected the pending claims under 35 USC §103(a) as allegedly being unpatentable over Nanaumi, *et al.* (US Patent Publication No. 2003/0049518) in view of Brunk, *et al.* (US Patent No. 7,267,902) or over Nanaumi in view of Brunk and further in view of Biegert (US Patent Publication No. 2003/0049367).

Applicants respectfully disagree with the Examiner's positions. The Examiner repeatedly admits that the Nanaumi reference fails to teach the limitation that the edges of the gas diffusion layers and the surface of the ion-conducting membrane that is not supported by the gas diffusion layer on the front side are enclosed by a sealing material which comprises a thermoplastic polymer and is reinforced by an electrically insulating inorganic material. See the February 15, 2011 Office Action, the bridging paragraph on pages 4 and 5, and the bridging paragraph on pages 8 and 9.

To overcome this shortcoming of Nanaumi, the Examiner cites to Brunk. However, Brunk does not appear to be proper prior art against the subject application. Brunk was filed August 27, 2004 (a month and a half after the effective filing date of the present application of July 14, 2004). Brunk does claim priority to a provisional application filed August 29, 2003 (Provisional application 60/498,818). But even if the

provisional application of Brunk supports the Examiner's rejection, the present application has an earlier priority date of July 14, 2003 (based on German application 103 31 836.4, filed July 14, 2003). Accordingly, the rejections based on Brunk should be withdrawn.

Moreover, even if Brunk was proper prior art against the subject application, Brunk does not teach the limitations of independent claim 23 which requires that the edges of the gas diffusion layers and the surface of the ion-conducting membrane that is not supported by the gas diffusion layer on the front side are enclosed by a sealing material which comprises a thermoplastic polymer and is reinforced by an electrically insulating inorganic material.

In the February 15th Office Action, the Examiner combines teachings regarding two separate and distinct elements of Brunk – the insulation layer (#14 in Brunk's figures) and the sealing polymer (#15 and 15') in order to assert that the characteristics of the sealing material of the present invention are known. As the Examiner points out, Brunk may disclose the use of a sealing polymer to enclose the edges of the gas diffusion layers and the membrane. But, the reference does not teach or suggest that the sealing polymer may be reinforced with an electrically insulating inorganic material.

The Examiner seems to be of the opinion that the presence of a separate insulating layer in Brunk constitutes reinforcement of the sealing polymer in accordance with the present invention. This is incorrect. First of all, in Brunk the insulation layer is positioned between the gas diffusion layers and does not necessarily contact or extend into the sealing polymer around the edges of the diffusion layers and the membrane. The purpose of the insulation layer is to separate and isolate the two gas diffusion layers – not to reinforce the sealing polymer. So based on the disclosure of Brunk, one skilled in the art would have no motivation to combine the insulation layer and the sealing polymer.

Secondly, even if the insulation extends into the sealing polymer, its presence there does not constitute reinforcement of the sealing polymer as that term is used in the

present application. In the present application reinforcement of the sealing material is accomplished by the addition of chemically inert, electrically insulating inorganic fillers – such as glass fibers or spheres – into the sealing material. These electrically insulating inorganic fillers are introduced to the sealing material by compounding them with the sealing material before production of the polymeric sealing frames. See page 13, lines 21-34, of the present application:

In a further embodiment of the invention, fillers are incorporated into the polymeric frame material to increase the creep strength of the frame. Possible fillers are chemically inert and electrically insulating inorganic materials such as glass fibres or glass spheres. The materials are introduced into the polymeric frame material by compounding before production of the sealing frames. Typical contents of reinforcing materials are in the range from 10 to 30% by weight. The filler-reinforced polymers are processed to foils by conventional film production processes and cut into frames. The frames can be joined by means of heat and pressure to the MEA structures according to the invention.

Nowhere in Brunk is it disclosed that the sealing polymer has electrically insulating inorganic fillers.

In order to emphasize this distinction between the cited references and the present invention, Applicants have herein amended independent claim 23 to include the limitation that the sealing material is reinforced by an electrically insulating inorganic material which is incorporated into the sealing material as a filler during compounding.

The cited references, either alone or in combination, do not disclose, teach or suggest sealing the edges of the gas diffusion layers and/or the membrane with a thermoplastic polymer that is reinforced by an electrically insulating inorganic material wherein the material is incorporated into the sealing material as a filler during compounding. Nowhere in Nanaumi, Brunk or Biegert is it taught to reinforce a thermoplastic polymer sealing material with electrically insulating, inorganic fillers. In light of this deficiency of the references, Applicants maintain that the claimed invention,

as presently set forth in the amended claims above, is patentably distinct from the Nanaumi, Brunk and Biegert references, either alone or in combination.

In light of the foregoing remarks and claim amendments, Applicants respectfully request withdrawal of the rejections set forth in the February 15, 2011 Office Action and solicit allowance of the present application.

No fee is believed due in connection with the filing of the present amendment, other than the fee for the accompanying RCE, which has been charged to credit card. If any additional fees are due, please charge our Deposit Account No. 50-5371 for such sum.

If the Examiner has any questions regarding the present application, the Examiner is cordially invited to contact Applicants' attorney at the number provided below.

Respectfully submitted,

A handwritten signature in black ink, reading "John J. Santalone", written over a horizontal line.

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